

ENERGY ENGINEERING ANALYSIS PROGRAM

CROOM TOWNHOUSES (CAMERON STATION)
CROOM, MARYLAND

FINAL SUBMISSION
VOLUME 1
EXECUTIVE SUMMARY
AUGUST 7, 1986

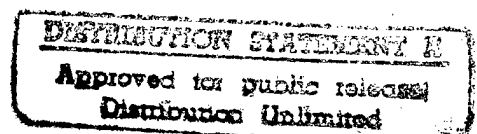
CONTRACT NO. DACA 31-82-C-0307
DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT CORPS OF ENGINEERS

19971021 328

DHC QUALITY INSPECTED 2

Prepared By

Ewing Cole Cherry Parsky
Architects Engineers Planners
Federal Reserve Bank Building, 100 N. 6th Street
Independence Mall West, Philadelphia, PA 19106



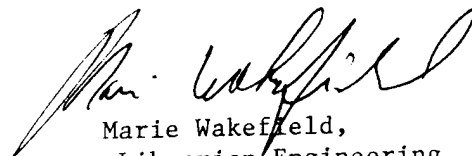


DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS
P.O. BOX 9005
CHAMPAIGN, ILLINOIS 61826-9005

REPLY TO
ATTENTION OF: TR-I Library

17 Sep 1997

Based on SOW, these Energy Studies are unclassified/unlimited.
Distribution A. Approved for public release.


Marie Wakefield,
Librarian Engineering

CROOM TOWNHOUSES (CAMERON STATION)

FINAL SUBMISSION

VOLUME 1 EXECUTIVE SUMMARY

TABLE OF CONTENTS

	<u>PAGE NO.</u>
1. Introduction	ES-1
2. Historical Energy Consumption	ES-2
3. Energy Conservation Measures Developed	ES-3
4. Increment "F" - Facility Engineering Conservation Measures	ES-6
5. Energy Saving	ES-9
6. Energy Management Control System	ES-11

1. INTRODUCTION

The Croom Townhouses were originally utilized as housing for personnel stationed at the NIKE Missile Site and located in this area. The Site consisted of three parcels of land; the housing parcel, an administrative parcel, and the launch site. The Administrative Building is now utilized as an elementary school. The launch site is not being used. The Croom Townhouses are now utilized as housing for Army personnel of the Military District of Washington, DC.

The Croom Townhouse complex consists of three (3) separate buildings containing living units, a Water Pumping Station, and a Sewage Treatment Facility. Building No. 9 contains five two-story townhouses, Building No. 4 contains four two-story townhouses, and Building No. 12 contains three two-story townhouses.

The Army Energy Plan, established in early 1978, sets both short and long term energy goals for the Army consistent with the Presidential Executive order issued in mid-1977. Presidential order 12003 calls for a reduction of 20% in energy use in existing Federal Buildings by fiscal year 1985, as measured against the base line energy consumption of fiscal year 1975. The Army Energy Plan directs the Major Army commands to develop detailed implementation plans and funding documents.

The National Energy Conservation Policy Act (NECPA) of 1978 directs that all facilities owned and operated by a federal agency must have all cost-effective energy conservation retrofits performed by 1 January, 1990.

The Department of the Army, through the Corps of Engineers Baltimore, has contracted with Ewing Cole Cherry Parsky to provide the Energy Engineering Analysis Program (EEAP) at The Croom Townhouses (Cameron Station) under contract number DACA31-82-C-0307.

2. HISTORICAL ENERGY CONSUMPTION AND COST

The data which follows was provided by Headquarters, U.S. Army Military District of Washington.

Information for FY 75 is not available and this precludes complying with the contract requirement for comparing projected energy consumption savings with FY 75 values.

Monthly breakdowns for consumption and costs as well as monthly and annual breakdowns of electrical costs for demand and consumption also were not available.

	<u>FY 83</u>	<u>FY 84</u>	<u>FY 85</u>
Electrical Consumption (KWH)	138,185	176,000	186,000
Electrical Costs	\$9,673	\$11,803	\$13,875
#2 Oil Consumption (Gallons)	8,159	6,552	4,788
#2 Oil Costs	\$9,872	\$6,748	\$4,931

Part of the increase in electrical consumption and costs can probably be attributed to the change from two window units to central air conditioning for

each housing unit. Although window units are typically less efficient at peak load than central air conditioning, the use of multiple units allows them to take better advantage of load diversity than can be attained by a single central unit.

The decrease in oil consumption can be attributed to the addition of ceiling insulation in 1983 and vinyl siding and insulation in 1985.

3. ENERGY CONSERVATION MEASURES DEVELOPED

3.1 ECO'S INVESTIGATED

The following Energy Conservation Opportunities were investigated for the Croom Townhouses.

ECO-1	Add Wall Insulation, First Floor
ECO-2	Replace Kitchen Incandescent Lamp with Fluorescent Lamp
ECO-3	Night Setback Thermostat for Heating
ECO-4	Add Shower and Lavatory Flow Restrictors
ECO-5	Heat Recovery - Air Conditioning to Domestic Hot Water
ECO-6	Replace Kitchen Incandescent Fixture with Fluorescent Fixture

The table on the following page shows the results of the investigation. Mr. Clarence Nunley, Project Manager for Croom Townhouses, from Military District of Washington, Fort Lesley

J. McNair, has informed Ewing Cole Cherry Parsky that ECO's 2, 3, and 4 will be implemented by maintenance personnel (Increment F). Since the other ECO's have SIR less than 1, they do not qualify as viable and, therefore, there are no ECIP or Increment G projects.

3.2 Results of Detailed Energy Conservation Opportunity Investigations

ECO NO.	DESCRIPTION	TOTAL PROJECT COST (\$)	INVESTMENT COST (\$)	ANNUAL ENERGY SAVINGS (MBTU/YR)	FIRST YEAR COST SAVINGS (\$)	TOTAL DISCOUNTED SAVINGS (\$)	NON-ENERGY DISCOUNTED SAVINGS (\$)	\$/R
ECO-1	Add Wall Insulation - First Floor	12,377	11,139	71.2	515	5,786	124	.52
ECO-2	Replace Kitchen Incandescent Lamp with Fluorescent Lamp	174	157	13.5	102	543	129	3.47
ECO-3	Night Setback Thermostat for Heating	1,686	1,517	59.4	441	4,996	---	3.29
ECO-4	Add Shower and Lavatory Flow Restrictors	1,441	1,297	391.2	2,159	24,034	---	18.54
ECO-5	Heat Recovery - Air Conditioning to Domestic Hot Water	14,772	13,294	114.2	634	7,053	---	.53
ECO-6	Replace Kitchen Incandescent Fixture with Fluorescent Fixture	1,445	1,301	13.5	102	1,075	246	.83

INCREMENT F - FACILITY ENGINEER CONSERVATION MEASURES

4.1 Energy Actions Implemented At Croom

The following improvements have been implemented at the Croom Housing Units by the Military District of Washington:

Replaced single-glazed windows with double-glazed aluminum windows with thermal break in 1983, including removal of wall exhaust fan and closing opening with insulating glass.

Added 6-inch fiberglass insulation in the ceiling, 1983.

Changed heating systems in 1984-1985 by installing new warm air furnaces (oil-fired).

Installed central air conditioning in 1984-85.

Added vinyl siding and R7.7 rigid insulation board in 1985.

MDW has stated that these improvements were made because of needed maintenance due to deterioration of the facilities and not for energy improvement and, therefore, no calculations were made for their effect on energy consumption. MDW does not anticipate any further building improvements in energy conservation type projects.

4.2 Summary of Projects

Table 4.3 on the next page summarizes Increment F projects. There are no ECIP or Increment G projects.

4.3 PROJECT SUMMARY TABLE

PROJECT NO.	ENERGY CONSERVATION MEASURE	ANN. ENERGY SAVINGS (MBTU/YR) OIL	ANN. ENERGY SAVINGS (MBTU/YR) ELECTRICITY	FIRST YEAR COST SAVINGS (\$)	LABOR HOURS	MATERIAL COSTS	SIR	TOTAL PROJECT COST
F-1	Add Shower and Lavatory Flow Restrictors	---	391.2	2159	26	304	18.54	1441
F-2	Replace Kitchen Incandescent Lamp with Fluorescent Lamp	---	13.5	102	--	156	3.47	1445
F-3	Night Setback Thermostat for Heating	59.4	---	441	8	1020	3.29	1686
F-4	Domestic Water Heater Insulating Jackets	*	*	*	*	120	*	120
	TOTALS	59.4	404.7	2702	34	1600		4692

*Nonquantifiable self-help energy savings

5. ENERGY SAVING

5.1 Recommendations

It is recommended that all Increment F projects be implemented, and done so as soon as possible, in order to maximize energy savings. Priority for implementation can be established in order of decreasing SIR, with highest SIR being accomplished first. Ultimately, however, implementation should be left to the discretion of the facility, as other implementation criteria may be involved.

5.2 Projected Energy Savings

Table 4.3 on page ES-8 summarizes the potential energy savings. This indicates a potential savings of 59.4 MBTU of oil and 404.7 MBTU of electricity per year, if all of the Increment F projects are implemented, with a grand total potential savings of 464.1 MBTU per year.

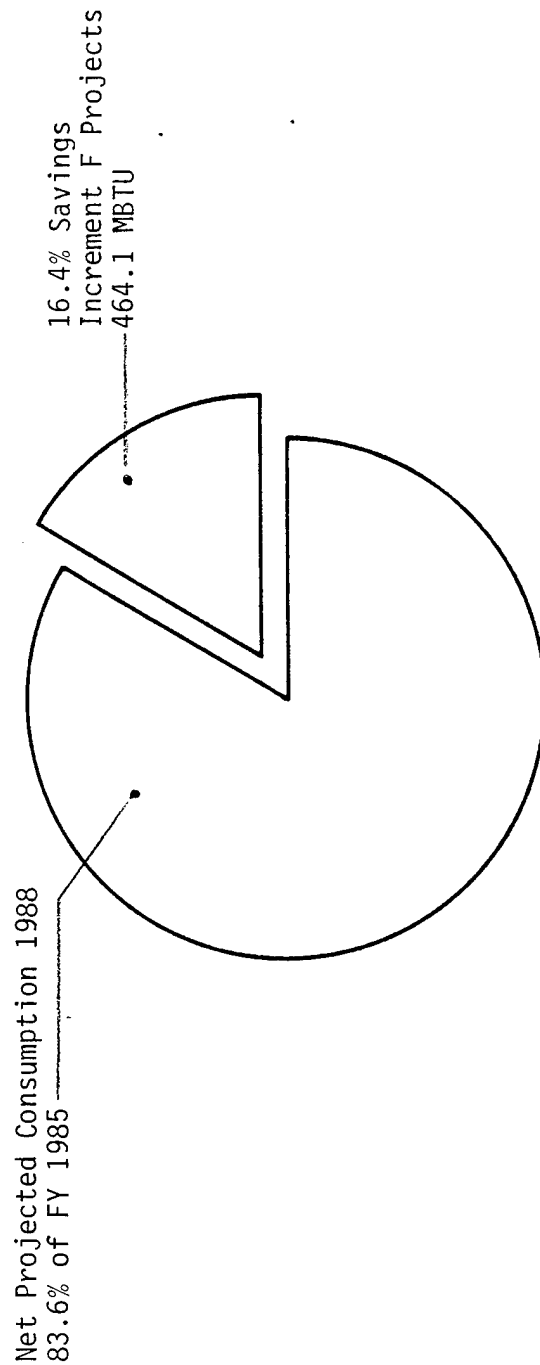
There is no information available on the projected energy savings/costs for the items previously implemented by MDW, and there is no information available for FY 75 energy consumption or costs. This lack of information precludes complying with the contract requirement for comparing projected energy savings with FY 75 values.

The following table and pie compares projected FY 88 consumption with actual FY 85 consumption if all Increment F projects are implemented.

5.3 ENERGY CONSUMPTION AND PERCENTAGES BY FUEL TYPE

FY 1988 VS 1985 WITH INCREMENT F PROJECTS ACCOMPLISHED

FUEL TYPE	FY 1985		PROJECTED FY 1988		
	CONSUMPTION MBTU	% TOTAL CONSUM.	PROJECTED CONSUMPTION MBTU	% TOTAL CONSUM.	% 1985 CONSUM.
Electricity No. 2 Fuel Oil	2157.6	76.5	1752.9	74.4	81.2
	<u>664.1</u>	<u>23.5</u>	<u>604.7</u>	<u>25.6</u>	<u>91.1</u>
	2821.7	100.0	2357.6	100.0	83.6



FY 1988 PROJECTED VS 1985 CONSUMPTION

6. ENERGY MANAGEMENT CONTROL SYSTEM

The possibility of using EMCS functions (Monitoring Space Temperatures, Scheduled Start/Stop, Night Setback for Heating, Duty Cycling and Demand Control) were reviewed and are not recommended as being appropriate for a housing facility of this type.